

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problems Mailbox.**

In re: Theodore Martin Boyd-Davis, et al.
Appl. No.: 10/016,524
Filed: December 10, 2001
Page 2

REMARKS/ARGUMENTS

Claims 1-5, 10, and 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,575,364 to Frederick in view of U.S. Patent No. 5,468,099 to Wheatley, et al. Claims 6-9, 11, and 13-16 have been indicated to be allowable if rewritten in independent form to include the limitations of the base claim(s).

With regard to the rejection of Claims 1-5, 10, and 12, Applicants respectfully submit that neither Frederick nor Wheatley, et al., alone or in combination, teach or suggest the invention as claimed. In particular, Claim 1 is directed to an apparatus for guiding and positioning a machine component relative a surface of a workpiece, the apparatus having "first and second elongate flexible rails, the rails being spaced apart and approximately parallel to each other [and] a plurality of vacuum attachment devices connected to each rail and spaced at intervals therealong for releasably attaching each rail to the surface of the workpiece by vacuum. . . ." In contrast, Frederick describes a flexible track having a cavitated base, i.e., the back 14 of track 10 is cavitated to form a vacuum chamber 18 when the track 10 is mounted on a workpiece W as shown in Figure 2. Parallel rails 24 extend laterally from the sides 16 of the track 10, and a tool holding carriage C mounts on the track with rollers in contact with the rails 24. The rails and, hence, the tool holding carriage C, are attached to the workpiece W by vacuum pressure generated by a pump P that is connected to passageways 22 of the tracks 10 through conduits H. Frederick does not teach "a plurality of vacuum attachment devices," as set forth in Claim 1. Further, Frederick neither teaches nor suggests "a plurality of vacuum attachment devices connected to each rail and spaced at intervals therealong." Instead, the vacuum chamber 18 appears to extend continuously along the length of the track 10, ending only at the end of the track 10 (as shown in Figure 4).

Wheatley, et al. describe a seam tracking drilling machine 10 that senses and moves along a seam 12 between abutting skin panels 14, 16. The drilling machine can be supported on the panels 14, 16 by a first set of variable height vacuum cup assemblies 22, 24, 26, 28 or a second set of variable height vacuum cup assemblies 66, 68, 70, 72. The configuration of the two sets can be adjusted by moving a middle carriage 48 or an inner carriage 62, along rails 44,

In re: Theodore Martin Boyd-Davis, et al.
Appl. No.: 10/016,524
Filed: December 10, 2001
Page 3

46 or 56, 58 respectively. When one set of the cup assemblies is activated for attachment to the panels 14, 16, the other set is deactivated to allow the machine to walk along the seam 12. None of the rails are flexible, as recited in Claim 1. Thus, Wheatley, et al. does not disclose the invention as set forth in Claim 1.

The Examiner has asserted that "it would have been obvious to one having ordinary skill in the art at the time of the invention to have combined the plurality of vacuum cups [of Wheatley, et al.] with Frederick's rails for the purpose of releasably attaching each of the rails to the work piece surfaces." Applicants disagree and respectfully assert that, even if the combination of the noted features of Frederick and Wheatley, et al. did result in the invention as recited in Claim 1, there is no motivation to combine these features. Wheatley, et al. provides two sets of vacuum cups for the purpose of allowing the drilling machine 10 to "walk" along the seam 12 of the panels 14, 16, thereby moving the machine 10 and, hence, the rails 44, 46 or 56, 58. In contrast, the rails 24 of Frederick's machine 10 are secured to the workpiece W and the carriage C is moved along the track 10. Thus, it would not have been obvious to a person of ordinary skill in the art to provide vacuum cups on the track of Frederick.

Alternatively, Applicants have described in the application of the present invention a machine 20 including "a pair of rails 22, 24 to which a plurality of attachment devices, preferably in the form of vacuum cup assemblies 26, are releasably affixed at spaced intervals along the length of each rail." See specification at page 6, lines 12 to 14. "Preferably, the rails are rigidly affixed to each other at only one end by a connecting member 28, which fixes the spacing between the rails at that end. At other locations along the rails, the spacing between the rails can vary as noted." See specification at page 6, lines 20 to 22. Thus, the plurality of vacuum attachment devices connected to each rail and spaced at intervals therealong allow the rails to be separately affixed to the workpiece, e.g., with varying spacing therebetween.

For the foregoing reasons, Applicants submit that Claim 1 is not unpatentable over Frederick in view of Wheatley, et al., and Claim 1 is thus allowable over the cited art. Therefore, each of Claims 2-5, 10, and 12, which depend from Claim 1 directly or indirectly, are also allowable.

In re: Theodore Martin Boyd-Davis, et al.
Appl. No.: 10/016,524
Filed: December 10, 2001
Page 4

Further, Claims 2-5 each provide further bases for patentability over the cited references. In particular, Claim 2 provides that "each rail is relatively stiff in bending about a first bending axis and relatively flexible in bending about a second bending axis orthogonal to the first bending axis. . . ." The Examiner has asserted that "Frederick does not show three-dimensional axes in his figures. However, the examiner has construed a first bending axis that is normal to the work piece surface, as an axis coming out of the page and a second bending axis as an axis running from the bottom to the top of the page (see Fig 1)." Frederick does not teach that the rails are relatively stiff about any axis. Instead, the track 10 described by Frederick "is preferably fabricated from a fiber-resin material of suitable flexibility to permit its being formed into various configurations as the configuration of the workpiece dictates. . . ." See col. 2, lines 13 to 15. Further, "although the edge of the workpiece W at its joinder with the ring W' is shown as a straight line, track 10 is sufficiently flexible to permit its being shaped to follow an edge of serpentine configuration as well." See col. 2, lines 17 to 21. Thus, the track 10, and presumably the rails 24, are flexible about each of the axes described by the Examiner, and are not "relatively stiff in bending about a first bending axis" as set forth in Claim 2.

Claim 3 provides "a connecting member connected between the rails at a location therealong to substantially fix a spacing distance between the rails at said location, the rails having freedom to move toward and away from each other at other locations remote from said location." Neither Frederick nor Wheatley, et al. describe such a configuration. Indeed, the rails 24 described by Frederick extend parallel from the sides 16 of the track 10. See col. 2, lines 5 and 6. Thus, the rails 24 do not have "freedom to move toward and away from each other," as set forth in Claim 3.

Claim 4 provides that the "attachment devices comprise vacuum cups." The Examiner noted that "Frederick does not disclose a plurality of vacuum devices attached to each rail wherein the vacuum devices are vacuum cups," but asserted that "[i]n view of Wheatley, et al, it would have been obvious to one having ordinary skill in the art at the time of the invention to have combined the plurality of vacuum cups with Frederick's rails for the purpose of releasably attaching each of the rails to the work piece surfaces." Applicants disagree for the reasons set forth above and, in particular, because even if the combination of the noted features of Frederick

In re: Theodore Martin Boyd-Davis, et al.
Appl. No.: 10/016,524
Filed: December 10, 2001
Page 5

and Wheatley, et al. did result in the invention as recited in Claim 4, there is no motivation to combine these features. Wheatley, et al. provides two sets of vacuum cups for the purpose of allowing the drilling machine 10 to "walk" along the seam 12 of the panels 14, 16, thereby moving the machine 10 and, hence, the rails 44, 46 or 56, 58. In contrast, the rails 24 of Frederick's machine 10 are secured to the workpiece W and the carriage C is moved along the track 10. Thus, it would not have been obvious to a person of ordinary skill in the art to provide vacuum cups on the track of Frederick.

Claim 5 provides that "the X-axis carriage is connected to the rails by flexible mounts." For example, as Applicants described in the application of the present invention:

The spring plates 34, 36 on which the rollers are mounted flex and twist as needed (i.e., dictated by the contour of the workpiece surface as the X-axis carriage traverses the rails) to allow a limited degree of relative movement to occur between the X-axis carriage 30 and the rollers 32. . . . Thus, a limited degree of relative movement can occur between the X-axis carriage and the rails 22, 24. The net result is that the flexible track machine 20 enables the X-axis carriage to traverse the rails along the X-axis (i.e., the axis parallel to the length direction of the rails) even though the rails may be bending and twisting in somewhat different ways relative to each other."

See specification at page 6, lines 12 to 14. The Examiner has asserted that "although Frederick does not explicitly disclose the rollers are connected to the rails by flexible mounts, it is implied that the rollers are flexibly mounted on the rails since Frederick discloses (column 2, lines 19+) that track is sufficiently flexible to follow a variety of contours." Applicants submit that such flexibility is neither taught nor suggested by Frederick. Further, Frederick does not teach that the rails 24 bend and twist in somewhat different ways relative to each other, as described in the application of the present invention, or that the rails 24 are otherwise flexed in such a way to require flexible mounts, as claimed.

Thus, Applicants submit that Claims 2-5, 10, and 12 are each patentable over the cited art.

* * * *

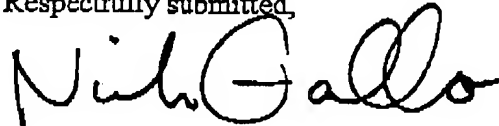
In re: Theodore Martin Boyd-Davis, et al.
Appl. No.: 10/016,524
Filed: December 10, 2001
Page 6

CONCLUSIONS

In view of the amendments and remarks presented above, Applicants submit that the present application is in condition for allowance. As such, the issuance of a Notice of Allowance is therefore respectfully requested. In order to expedite the examination of the present application, the Examiner is encouraged to contact Applicants' undersigned attorney in order to resolve any remaining issues.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,



Nicholas F. Gallo
Registration No. 50,135

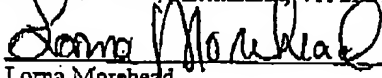
Customer No. 00826
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Charlotte Office (704) 444-1000
Fax Charlotte Office (704) 444-1111

CLT01/4610346v1

In re: Theodore Martin Boyd-Davis, et al.
Appl. No.: 10/016,524
Filed: December 10, 2001
Page 7

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop Non-Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on November 19, 2003


Lorna Morehead